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This is a report on a survey to determine the feasibility of establishing aviation training programs at a New York community college. It examines existing sources, and present and future needs for commercial pilots, aviation mechanics, and airline stewardesses. Among the conclusions are the discovery that the aviation industry is on the threshold of a quantum leap, that no organized attempt has been made to provide training for the coming generation of students who will fill the needs of the aircraft industry, that the demand for licensed Air frame and Power plant (A&P) mechanics far exceeds the supply and predicted need, that no shortage of applicants is expected for airline stewardesses, and that approximately 20 junior colleges in the United States now offer programs in commercial pilot training. This report includes a list of resource personnel in the aviation industry, and results of a survey of 25 high school guidance counselors throughout New York state regarding student interest in aviation. (JC)

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FEASIBILITY STUDY FOR AVIATION PROGRAMS AT HUDSON VALLEY COMMUNITY COLLEGE

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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SUBJECT

A survey of present and future employment opportunities in the aviation industry and the feasibility of offering training programs for this type of employment at Hudson Valley Community College on the Associate Degree level.

PREPARED BY

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DATE

July 17, 1968

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JC 690 181

UNIVERSITY OF CALIF.
LOS ANGELES

MAY 05 1969

CLEARINGHOUSE FOR
JUNIOR COLLEGE
INFORMATION

June 12, 1968

TO: MR. BUCKLEY

FROM: PRESIDENT FITZGIBBONS

Hudson Valley Community College is totally committed to the concept of its mission as a comprehensive community agency with a mandate for immediate response to developing and changing community needs. Consistent with this position it is ever alert to explore new areas of service to the supporting constituency; e.g., new curriculums, participation in area studies, coordination and implementation of regional developments.

Expected developments of airport facilities in Rensselaer County would certainly give thrust and impetus to critical review of the needs for an aviation curriculum at this college. Such a study, of course, would require adequate supporting documentation, and the involvement of the several appropriate sectors of education both at Hudson Valley Community College and to higher authority residing in State University of New York and the State Education Department.

PART I. INTRODUCTION

The aviation industry is the largest, non agrarian employer of people in the United States.[1] This includes manufacturing, transportation of freight and passengers, and all of the supporting industries. 1,400,000 persons were employed by this industry at the end of 1966 and it is estimated that employment will double in the next ten year period based on the present growth rate.[2] In view of this, it is appropriate that consideration be given to the establishment of aviation curricula at the community college level to provide training for young persons who desire to become associated with the aviation industry and to reap the social and economic benefits derived from association with this dynamic and rapidly expanding industry.

Scope and Delineation.

The purpose of this study is to consider the feasibility of establishing curricula on the associate degree level for commercial pilots, maintenance personnel and airline stewardesses. The justification for these curricula will be based on a statewide need for these persons rather than on a countywide need. A second justification will be based on the desire of young people living in the area to obtain this training.

Methodology.

Information for this report was obtained from several sources, including fixed base operators, local representatives

of airlines operating in New York State, officers of corporations using aircraft in their operations, high school guidance counselors, high school vocational teachers, college personnel presently offering aviation training programs, local representatives of the Federal Aviation Agency (F.A.A.), and members of the New York State Department of Transportation. Contacts were made by personal interview, letters with questionnaires, telephone calls and conferences. This writer also attended the aviation briefing for community colleges held at Kansas City, Mo., on April 1, 2, 3, 1968. This conference was sponsored by the Metropolitan Junior College of that city and cosponsored by the Link Foundation. Two hundred fifty-eight persons attended this conference of which 150 were college faculty, and the remainder were aviation industry personnel, members of the Federal Aviation Agency, and members of various state aeronautics commissions. This conference provided an excellent source of material for this report and presented the opportunity to learn what leaders of other two-year colleges in this country are doing or contemplating.

Included in this report are the results of a survey conducted prior to the initiation of this study. This prior survey consisted of a questionnaire sent to twenty-five high school guidance counselors throughout New York State and is self explanatory.

PART II. BASIC STUDY

Sub part I. - COMMERCIAL PILOTS

A. Existing Sources of Trained Commercial Pilots.

At the present time, a person wishing to make piloting his career must have at least a commercial pilot license. This is required in any occupation where the person is paid for the service of flying and also in many occupations where flying is carried on as an adjunct to the occupation. To obtain the commercial license, there are three avenues open. The first possibility is for a person to do it on his own. This involves flying for a minimum of 200 hours; about 50 hours of this with a certified instructor, and the remainder by himself in solo practice. The student is also on his own to obtain sufficient information to pass the written examinations for both the private and commercial licenses. It is not necessary to obtain the private license before the commercial, but it is generally done in order to permit the person to legally carry passengers, without compensation, while working for the commercial license.

The second avenue is to obtain the training at an FAA approved flying school. These schools are usually operated by an airport fixed base operator. They are approved by, and under the supervision of, the FAA. The student using this avenue may qualify for a commercial license with 160 hours of dual and solo flight. In addition, a

ground school may be offered by the school making it easier for the student to obtain information necessary to pass the written tests.

The third avenue is to attend a junior or community college with a commercial pilot training program. Of the three avenues, the third is most preferable, the first is the least preferable, if any significant number of pilots are going to be trained. The first method would probably be the most expensive, and the least desirable from the standpoint of quality. Its only advantage is its universality, since anyone with access to an airplane and an instructor may embark on such a program. Lack of supervision on such a program tends to produce wide variations in the quality of the finished product, the pilot.

The second avenue, the approved flying school run by a fixed base operator or an airport flying school, has several advantages. The training is more organized, follows a syllabus published by the FAA, and because of the reduction in pilot hours required is usually less expensive than the first avenue. The disadvantage of these schools is that there are not enough of them to handle the anticipated demand for training, and most of them are located around large metropolitan airports already overcrowded with traffic. As of January 1967 there were 38 such schools in New York State, with only 15 of these offering the ground school for commercial pilots.[3] Another disadvantage of these schools is that

they are only marginally profitable for the operator, compared with other services being offered, hence the school function is frequently subordinated, or curtailed in favor of other more profitable services such as charter flights. Also, since the quality of instruction is a function of the integrity of the operator, there is a wide variation in the quality of the finished product, the pilot.

The third avenue is by far the most desirable for a number of reasons; the student is in a college atmosphere, which is conducive to academic success. Ground school courses necessary for passing written tests are offered by the college. In addition, the student is associated with other students and faculty who are aviation minded. This promotes esprit de corps which reinforces the learning process. While there are several ways for a college to arrange for the student flight training, all of them allow some degree of supervision, hence the quality of instruction is enhanced and the finished product is on the average, superior.

B. Present Need for Commercial Pilots.

A commercial pilot may find employment in the following areas: airlines, corporations owning aircraft, charter work, air taxi work, flight instruction, agricultural work, conservation department work, airplane sales and there are many openings for pilots with the FAA both in flying and non-flying categories.

At the present time, the supply is about equal to the demand. There is no shortage of commercial pilots,

but on the other hand, almost anyone with a commercial license can obtain some type of piloting work provided other qualifications are met. Commercial pilots with less than 1200 hours may find it difficult to obtain an adequate salary from their flying. The reason for this is that most insurance companies specify 1200 hours or more time for flight in twin engine retractable gear aircraft. As a result, most new pilots are restricted to jobs where they can fly single engine, fixed gear aircraft. The most common of these jobs are the flight instructor and passenger hopper. After the 1200 hour point is reached, the pilot is eligible for a better position.

The so called airline pilot shortage which received so much publicity in 1966 was in reality only a technical shortage. The policy of the airlines is to require high pilot time and many additional ratings over the commercial license. Their actual requirements vary from time to time, and are based on supply and demand. Some airlines require over 2000 hours, instrument, multi-engine ratings and some jet time. Naturally, there will always be a shortage of pilots with these qualifications. Other airlines are more liberal. TWA has a policy where they will consider anyone with a commercial license and an instrument rating.

C. <u>Future Needs for Commercial Pilots</u>.

If the size of the aviation industry is to double, as predicted, in the next ten years, the demand for com-

mercial pilots will far exceed the supply unless some organized effort is made to increase the supply. While the airlines expect to increase their pilot requirements by 75%, an increase of 30,000 new pilots, the opportunities for pilots employed in general aviation will increase by 300%. This general aviation increase represents an increase of 150,000 new commercial pilot jobs. Among the factors accounting for this increase is a major change by the post office of first class mail from railroads to airplanes. This work is being contracted out to fixed base operators and most of the deliveries are made at night. This requires no increase in the number of aircraft, but has substantially increased the number of pilots employed. Another reason for the increase in general aviation pilots is the large number of businesses and corporations that are changing their basic mode of transportation from automobiles and scheduled airlines to their own aircraft.

Another future employment area for pilots will be as aviation education teachers in primary and secondary schools. Just as driver education is now universally taught in our high schools, aviation education will be taught in the future. This is already being done in 181 high schools throughout the country. Kansas, California, Nebraska, Ohio and Washington are the leaders in this type of education at the high school level.[5] Aviation education is being introduced in the primary grades via science and math courses in Arizona, California, Montana, Ohio, Oklahoma and Tennessee.[5] Graduates of

the two-year colleges will require further education in order to be qualified as high school teachers; hence, transfer programs should be set up with the four year schools of the State University so that these students may continue their education beyond the associate degree level.

D. Justification for Implementation of Commercial Pilot Training Programs.

The implementation of a curriculum for training commercial pilots certainly cannot be justified on the basis of the job opportunities in this county, or even in the capital district. However, on a statewide basis there are many opportunities. The biggest justification for a program like this is to fill the requests of potential students. Telephone calls to high school guidance counselors indicate that most of them are getting serious inquiries from students who are interested in entering the aviation field as pilots. If there were only one person per year from each high school in the capital district who desired this training it would be more than enough to begin such a program. The statewide questionnaire, sent out in 1966, also indicates that there is sufficient demand statewide to implement such a program. Further justification for a program can be made by virtue of the fact that once a department is set up, it can offer various amounts of training to all students on the campus who desire it. A liberal arts student might elect to

take an aviation survey course, or a student planning on a sales career might take enough training to obtain a private license. Most schools now giving pilot training give credit for flying at the rate of one semester hour credit for each fifteen hours of flight time, either dual or solo.

E. Method of Implementation and Facilities Required.

A program for commercial pilot training could be implemented at this school with little or no increase in facilities. The flight instruction could be contracted out to a local fixed base operator who would be solely responsible for the flight training. Present classroom and laboratory space could be utilized for the non flying portions of the curriculum. Faculty could be recruited from high school and college teachers who hold pilots licenses.

A second approach would be for the college to own or lease the airplanes, hire instructors, and charge the students a lab fee for the flight instruction. State Education law would have to be checked to see if such a lab fee were legal. This would be the most desirable from the standpoint of education, since it would give the school complete control over the flight instruction. Administered properly, it would also result in the lowest cost to the student provided no profit were realized.

There is only one high expense item recommended for early purchase in the ground school, that is the flight

simulator. With this device, some of the required flight instruction time can be given on the ground. Originally intended to give a simulation of instrument flight conditions, it is now being used for training both in instrument conditions and ordinary conditions known as visual flight rules (VFR). Other items such as mock ups and working models of aircraft systems could be purchased or built at the school as the need for these items developed.

Subpart II. AVIATION MECHANICS

A. Existing Sources of Trained Aviation Mechanics.

At present, the majority of licensed air frame and power plant mechanics come from two sources.

1. Persons who receive their training through an apprentice program which gives them the necessary experience requirements and prepares them for the FAA examination.
2. Persons who receive their training through FAA approved A & P schools.

FAA approved schools can be found in the proprietary type school and in two-year colleges. Of the latter, some grant the associate degree while others give a certificate.

B. Present Needs for Licensed A & P Mechanics.

The present need for licensed A & P mechanics far exceeds the supply. While interviewing fixed base operators in this area, each one said he would hire more mechanics if they were available. The airlines also feel this shortage but since they are unionized and pay higher wages, they have less difficulty in finding personnel. Wherever an airline operates a maintenance base, the local fixed base operator has difficulty obtaining personnel unless he is competitive with the airlines, which pay a starting wage of about $4.00 per hour. In many of the airports in the middle sized cities, it is difficult to get maintenance work done because of the shortage of mechanics.

Fixed base operators believe this is due to the lack of glamour in the job. Parents are reluctant to encourage their sons to enter a "grease monkey" type of profession. What they are unaware of are the rewards involved in this work. It is interesting and challenging, is not overly dirty, since aircraft must be maintained on regular schedules mandated by the FAA, and can be very remunerative for a capable person. One fixed base operator in this area pays his foreman mechanic $20,000 per year.

C. Future Needs - A & P Mechanics.

It is estimated that the airlines will need 90,000 new mechanics in the next years and general aviation will need 120,000 new mechanics in the same period.

D. Justification for Programs - A & P Mechanics.

While there is no doubt that a shortage of trained personnel exists, there is some doubt as to the demand by students for this type of training. Demand could be increased with some publicity by the industry calling to the attention of the public the need for such trained personnel. Another problem in justifying an A & P mechanic program is the cost of setting it up and the amount of space required. A program of this type leans heavily on shop work and up-to-date aircraft components. As in all shop courses, the usual rules for floor area per student apply. At present there is no such space available at this school; hence the program could not be implemented until such space became available.

E. Implementation of Programs - A & P Mechanics.

As mentioned in the preceding section, such a program could be implemented but would require adequate shop space, modern aircraft components for the shop and qualified instructors. The instructors should be licensed A & P mechanics with additional training in education. Men with degrees would be desirable, but may be hard to find with the A & P license. Non-shop courses could be given in existing classrooms.

An alternate to this approach would be to run a co-operative plan where the student receives his shop training while working on the job for a fixed base operator or an airline. This would eliminate the need for shop space and components and would enable the students to get their training on the most modern types of aircraft. It is common knowledge that shop components in aviation become obsolete quickly because of rapid advances in the industry. There are problems involved in this cooperative approach. Unions oppose it because it would involve the introduction of non union men in their shops. Since most airline mechanics work in union shops, airline participation is doubtful. Fixed base operators are also reluctant to become involved. Page Airways of Albany expressed fear of adverse customer reaction and loss of business if unlicensed mechanics were used in their operation.

Much high level negotiation with both union and management will be necessary before any cooperative program can be implemented.

Subpart III. AIRLINE STEWARDESSES

A. Existing Sources of Trained Airline Stewardesses.

There are three sources of trained personnel for airline stewardesses.

1. Proprietary schools which offer this training. Courses generally run about six weeks and are quite expensive considering the amount of training received.
2. A few junior colleges and aeronautical institutes offer training in this field. The junior colleges usually include it in an associate degree program.
3. Each airline arranges for its own stewardess training. The extent of this training varies all the way from a complete college campus and multiple building complex operated by American Airlines on down to minimal facilities on some of the smaller airlines. Some arrange to have their girls trained by other airlines on a contract basis. Present airline policy does not encourage attendance at either proprietary schools or junior college stewardess schools. Each airline arranges for the training of all girls hired, regardless of prior training received.

B. Present Needs for Airline Stewardesses.

The present demand for stewardesses is far exceeded by the number of applicants. The reason for this is the image attached to the job. Mohawk airlines has fifty applicants for each girl hired. Most girls don't even ask how much they will be paid. American hires one out of forty applicants. Their stewardesses only stay on the job an average

of one and one-half years. TWA stewardesses stay on the job an average of two years. American is presently hiring 800 girls per year. Mohawk is presently hiring 200 girls per year. Nationally, 26,000 stewardesses are employed, and 10,000 are needed annually for replacements. The other large airlines, such as TWA, United, and Eastern, are hiring numbers similar to American, and the smaller airlines hiring patterns are similar to Mohawk. Mohawk pays $425 per month to start.

C. Future Needs -- Airline Stewardesses.

American expects its hiring rate to increase to a maximum of 1400 per year in ten years. After that the picture is cloudy. There is some doubt that stewardesses will be required on supersonic airplanes since the maximum stage length will only be two and one-half hours. Mohawk expects its hiring rate for stewardesses to increase at the rate of 20% per year into the forseeable future. Since this type of employment is peculiar to the airline industry, opportunities for employment are limited to this industry.

D. Justification for Programs - Airline Stewardesses.

Little justification exists for implementing an airline stewardess training program. None of the airlines contacted expressed any interest in graduates of such a program. The reaction being, "We have to train them anyway," and "your graduates would get no more consideration than any other applicant." In view of the 50 to 1 ratio of applicants to hirees given to Mohawk Airlines, placing graduates of such a program might present problems. What the airlines do recommend is a two-year liberal arts type program with

several courses in aviation. Mt. San Antonio College, Walnut, California has such a program and reports that it is successful with 90% of its graduates placed in airline stewardess jobs. No attempt is made to screen the entering students, but a continual effort to "bring them up to airline standards" is made during the two-year program. This accounts for the high acceptance rate. A case history was cited at the Aviation Briefing Conference of a girl who weighed 150 pounds and was quite unattractive. This girl was transformed during the two-year program to the extent that she was hired by an airline as a stewardess upon graduation. Rangely College in Colorado operates a two-year airline stewardess training program. The college policy is to screen the girls prior to their acceptance on the basis of what type of girl the airlines are interested in hiring. The program is basically liberal arts with special instruction in speech, a foreign language, psychology, poise, personality development and grooming.

PART III. CONCLUSIONS

1. The aviation industry is on the threshold of a "quantum leap" that began in 1965 and will continue to at least 1980.

2. Personal transportation in the future will be limited to the automobile and aircraft. Other forms of personal surface transportation will diminish, unless some means of obtaining higher surface speeds is obtained.

3. No organized attempt has been made to provide training for the coming generation of students who will fill the jobs created by the "quantum leap" of the aviation industry.

4. There is a sufficient number of students from the capital district area, and a sufficient number of jobs in New York State to justify a two-year associate degree pilot training program.

5. The demand for aviation A & P mechanics far exceeds the supply and the future outlook is for the situation to become worse. Several problems including adequate shop space, trained teaching personnel for shop courses and the question of whether to run such a program on the vocational level or the technical level in an associate degree program, would have to be worked out before implementing such a program.

6. The demand for airline stewardesses is exceeded by the number of girls applying for these jobs. While the number of these jobs will increase in the future because of airline growth, no shortage of applicants is expected. The community college can perform a service in this area by providing a general type of training for girls interested in this occupation.

7. There are approximately 20 junior colleges in the United States offering programs in commercial pilot training. There are a similar number that offer programs for training aviation mechanics. Five are known to offer some form of training for airline stewardesses. As of the time this report is written, there are no junior colleges in New York State or in the Northeastern section of the country that offer pilot training or any form of training for girls who desire to work for the airlines. Anyone from this area who desires junior college training in these fields is forced to attend school a considerable distance from home. The Academy of Aeronautics, located at La Guardia Field, does offer a program in aircraft maintenance technology, but the cost of attending this school is much higher than that of a junior college. A few technical institutes in New England also offer aircraft mechanics programs, but the cost of attending these schools is much higher than the cost of attending a junior college.

PART IV. RECOMMENDATIONS

1. It is recommended that a department of aviation be created at Hudson Valley Community College.

2. It is recommended that an associate degree program in commercial pilot training be offered by the department of aviation.

3. It is recommended that any mechanic training program be deferred until after the department of aviation is organized and until the problems mentioned in the conclusion are resolved.

4. It is recommended that the department of aviation offer aviation courses to all students of the college on an elective basis. In this way, programs for training students for positions in airline management, fixed base operation, airline stewardesses, and many other aviation occupations could be provided as required.

The following is a list of persons and organizations contacted by telephone, mail, or in person during the course of this study.

R. K. Alexander - Aviation Consultant, N.Y.S. Department of Transportation

Steward Angle - Head, Aviation Department, Mt. San Antonio College, California

Harold Buker - President, Buker Airways, Springfield, Vermont

Andrew Deas - Corporate Pilot, General Electric Company, White Plains, New York

Patricia Giles (Mr.) - Supervisor, Stewardess Training, TWA, Kansas City, Missouri

Walter Glass - President, Industrial Flight Service, Schenectady, New York

Gus Hamm - Manager, Cape Aircraft Company, Glens Falls, New York

John Heaton - Airport Manager and President, Yankee Airlines, Pittsfield, Massachusetts

Jack Hunt - President, Embry Riddle Aeronautical Institute, Florida

Harve L. Larch - Albany District Sales Manager, American Airlines

Walter J. Koladza - President, Berkshire Aviation Enterprises, Great Barrington, Massachusetts

George Mehalis - Director, Technical-Vocational Studies, Miami Dade Junior College, Florida

Allen J. Nogard - Manager, Albany FAA, General Aviation District Office

Charles O'Niel - Manager, Page Airways of Albany

J. F. Rhodes, Capt. - Senior Pilot and Supervisor of Pilot Training, TWA, Kansas City, Missouri

Lewis Roberts - Director of Training, Mohawk Air Lines, Utica, New York

John E. Roberts (Dr.) - President, Rangely College, Colorado

George West - President, Mohawk Valley Aviation Company, North Adams, Massachusetts

High School Guidance Counselors throughout New York State

High School Teachers throughout the Capital District

REFERENCES

. A study to determine the feasibility of establishing a national program for training skilled aviation personnel. Prepared by Arizona State University for the United States Department of Commerce, 1967.

2. Project Long Look. Federal Aviation Agency study of future trends in aviation, 1965.

3. Federal Aviation Agency Advisory Circular AC#140-2C. List of certificated pilot flight schools and ground schools, 1967.

4. Feasibility study for Cochise College, Douglas, Arizona. Prepared by Cessna Aircraft Company, 1966.

5. Aviation Distributors and Manufacturers Association Bulletin, June, 1967.

ADDENDUM

The following sheet shows the results of a mailed questionnaire survey made prior to the beginning of this study. Twenty-five guidance counselors throughout New York State were contacted for this survey. Twenty replies were received. Some comments received with the questionnaire are included here.

"I think the interest and demand would be greater if a program existed. Students haven't thought of this mainly because of the distance to go for training." (Troy, New York)

"Would assume that interest in these programs would increase as more information becomes available." (Poughkeepsie, New York)

"We had four students last year apply for aircraft mechanics apprenticeship at the United Air Apprenticeship school in California. This year we had two seniors apply at Oklahoma State for pilot training and two for aircraft mechanics. Facilities in this area would promote further encouragement." (Endicott, New York)

"The Glens Falls area is serviced by Mohawk Airlines There is considerable expansion this year in service with increased flights, personnel, and number of passengers. There

are indications that this expansion will continue in this area. There is considerable interest in private flying. Many own planes resulting in considerable maintenance work." (Glens Falls, New York)

"While the number of students that we could supply to these programs would be small, it would be well to have an institution of your type sponsor these programs." (Corning, New York)

"Students who are interested in aviation are intensely interested." (Batavia, New York)

"The cost of flight training would only be a minor deterrent if New York State Higher Education Assistance loans were available." (Syracuse, New York)

SURVEY FOR AIRCRAFT MAINTENANCE AND PILOT TRAINING PROGRAM

On the basis of my contacts with high school students seeking vocational and educational guidance, the following opinions are given:

(25 questionnaires sent out -- 20 replies received)

The demand for a commercial pilot training program by students in my area would be:

Small	12 - 60%
Moderate	8 - 40%
Large	0 - 0%

The demand for an aircraft maintenance training program in my area would be:

Small	10 - 50%
Moderate	9 - 45%
Large	1 - 5%

If a student were interested in the pilot training program, the payment of $2,000 to pay for flight instruction would be a:

Major deterrent	14 - 70%
Minor deterrent	5 - 25%
No deterrent	1 - 5%

The students of my high school show:

Considerable interest in aviation	5 - 25%
Small interest in aviation	14 - 70%
No interest in aviation	1 - 5%

In the area that my high school serves, the demand for trained aviation mechanics and pilots is:

Pilots	
Substantial	2 - 10%
Small	10 - 50%
Nil	5 - 25%
Don't know	3 - 15%
Mechanics	
Substantial	3 - 15%
Small	9 - 45%
Nil	5 - 25%
Don't know	3 - 15%

I believe that the best way to finance the flight training in a pilot training program would be:

Let the student pay for it	3 - 15%
Let the school and the student share the cost	7 - 35%
Let the school absorb the cost	0 - 0%
Try to get the prospective employers to pay for it	4 - 20%
A combination of the above	6 - 30%